DRAFT OFL CV Decision Criteria Table for Bluefish

Decision Criteria	Summary of Decision Criteria Considerations	Assigned OFL CV Bin (60/100/150)
Data quality	**Surveys** • A fishery-dependent measure of abundance is obtained as catch-per-unit effort from the MRIP intercept survey (1985-2019),which constitutes a large component of data (recreational catch [landings+discards] = 88% of total). • Newly revised historical MRIP catch estimates were used in assessment. The new estimates scale up the entire MRIP catch series instead of converging in the 1980s as expected. • NEFSC fall survey data are available for all years (except fall 2017 Bigelow) in the assessment. This survey does not cover the southern portion of the species range. Bigelow estimates adjusted for results of cooperative research studies on gear efficiency. • Additionally, seven regional surveys are used in model tuning. **Landings and discards** • Age data available for all years in surveys (1982-2017), and age-length keys from surveys were applied to commercial landings and recreational landings. • Lengths of recreational discards were obtained through angler self-reporting from the Volunteer Angler Survey and minimal information from MRIP. • Commercial discards are low, considered negligible and not include in analysis. • Recreational discards are high at approximately 50% of the recreational landings over the time series, but greater than landings in 2019 thus, adding a level of uncertainty. • The MRIP calibration for live discards converges as expected in the 1980s to the MRFSS values, unlike the calibrated catch time series. Note also that recent discards are larger fish. Live discards are assumed to have a 0.15 mortality rate.	
Model appropriateness and identification process	• A complex ASAP SCAA model was used with fixed M=0.2 was used in the assessment model. • The fishery is modeled with two fleets: commercial and recreational. • The benchmark assessment authors tested several configurations of the ASAP SCAA before the current configuration was accepted. • The model is strongly driven by the MRIP index. YPR and AGEPRO models were also used to assess BRP and projections.	
Retrospective analysis	• Retrospective patterns in the operational assessment are considered minor, with retrospective errors over the last 7 terminal years averaging -22% for Fand +22% for SSB. • The SARC60 benchmark and subsequent updates showed similar trends for SSB, F, and recruitment. • Moreover, as the assessment has been updated more of the time series shows overfishing with the retrospective patterns, indicating that the	

	stock has been overfished with overfishing occurring over the past six years. • New calibrated MRIP data resulted in a rescaling of SSB, F, and R to higher estimates compared with old data.	
Comparison with empirical measures or simpler analyses	• Simple measures of comparison were used forage composition sand weight-at-age.	
Ecosystem factors accounted	• Aspects of the ecosystem seem to be changing in recent years. • Fall ocean bottom and surface temperatures are increasing, and salinity is at or near the historical high. These physical data series may have shifted around 2012, the warmest year on record for this ecosystem. • Spring chlorophyll concentrations, a measure of bottom-up ecosystem production in the Bluefish stock area, are variable, but the fall time series has been decreasing, especially during 2013-2017. • Spring abundances for key zooplankton prey are variable and may be worth examining along with other forage species. • Bluefish have two recruitment contingents, one in spring and one in fall, and both could be affected by changing abundances of forage. • The benchmark assessment used a thermal niche model to assess survey catchability of Bluefish	
Trend in recruitment	• Average recruitment from 1985 to 2019 is 46 million fish at age 0 with no real trend over time. • Recruitment has been approximately 15% below average over the last decade, except in 2013. • Overall recruitment is variable; the highest recruitment occurred in 1989 and the lowest in 2019,with an average recruitment of 45,744 age 0 fish.	
Prediction error	• Prior to the 2015 benchmark, comparisons of annual forecasts of stock biomass with realized estimates of stock biomass in subsequent assessments reveal a one-year ahead forecasting error with a CV=14%. For two-year forecasts the CV is 26%,and for 3 year forecasts the CV is also 26%. • The average percentage difference between the projection and the subsequent estimate for 1, 2, and 3-yr projections was +12%, +23% and +24%, respectively. • Inclusion of the revised MRIP data increased the population scale proportionately through the entire time series, rendering prediction comparisons less useful as a metric of model performance. Moreover, the MRIP calibration results in different patterns across the species that rely on this measure, hence increasing uncertainty. • Finally, the mode of fishing shows a trend to increasing shore fishing in the most recent years.	
Assessment accuracy under different fishing pressures	• Fishing mortality has varied over a 3-fold range during the assessment period, with a major decline in 2018 but a slight increase in 2019 to 0.72 that may be dependent on the MRIP recalibration. • Over the past decade F has fluctuated around the series average of F = 0.35,except for the dramatic decline in 2018 to F = 0.15. Recent Fs	

	over the 2010-2019 period have been relatively high with several recent ones low, resulting in better data contrast for modeling.	
Simulation analysis/MSE	• No formal MSE-type analyses have been conducted for this stock.	

Draft Narrative

The current assessment is an update of the 2015 benchmark assessment with added data through 2019. The chief uncertainty for Bluefish relates to patterns in the revised MRIP estimates. Bluefish are predominantly harvested by recreational anglers, who have averaged 88% or so of landings over the time series. The new calibrated MRIP time series for Bluefish resulted in a substantial increase in catch that approximately follows a similar pattern as seen in the old survey. For both Black Sea Bass and Scup, the original and revised MRIP catches converge in the 1980s when the telephone survey was deemed reliable. Original and revised MRIP catch estimates for Bluefish do not converge in the 1980s, and this adds to the uncertainty in the catch time series. In addition, the importance of dead discards has increased for this stock over time. Recreational discards in 2019 were estimated at 6,992 MT while landing were 6612 MT, with discards greater than landing for the first time in the series. Because MRIP data is an important component of input data to the ASAP model, it adds to uncertainty in model projections.